The Network as the Platform
“Web 2.0 Changes Virtually Everything”

Willie Oosthuysen
Director, Technical Operations
15th January 2009
Cairo, Egypt
Agenda

- Introduction to Web 2.0
- Key drivers for change – Disruption of the value chain
  - New software models as disruptor
  - Virtualization as disruptor
- Cisco Data Center Networking Architecture
- Enabling the transformation
Major Customer Transformations

Borderless Enterprise

Globalisation

Empowered User

Collaboration

Virtualization

Real-Time Information
Web 2.0 – Implications for the Enterprise
We’re at a Major Inflection Point That Will Change the Way We Work

Tremendous opportunity for businesses to move with unprecedented speed & alter the economics of their market

Emergence of the “Flat World”

Scale → Speed

Regional → Global

Vertically Integrated → Value-Chains

Unified Communications

Ubiquitous Bandwidth

Web 2.0

SOA

SaaS

Global Economic Change

Technical Innovation
What is Web 2.0, and how real is it?

- Web 2.0 (according to Wikipedia) is…
- A transition of Web sites from isolated information silos to sources of content and functionality, thus becoming a computing platform serving Web applications to end users.
- A social phenomenon referring to an approach to creating and distributing Web content itself, characterized by open communication, decentralization of authority, freedom to share and reuse, and "the market as a conversation."
- More-organized and categorized content, with a far more developed deep-linking Web architecture.
- A shift in economic value of the Web — up past a trillion dollars — surpassing that of the dot-com boom of the late 1990s.
“The needs of the many outweighs the needs of the few”

- “Collapsing the supply chain will cause software companies to **build better software**, more reliable software, lower cost software that can be deployed much faster. Ultimately, this reshapes the fundamental economic model for software companies”

- **Software maintenance revenue vs New license revenue** as measure of growth expectations for s/w companies

- By changing the fundamental cost model of software, a SaaS model can enable a software company to **reduce prices and maintain margins** vs traditional software competitors – we have seen this happen in the hardware business

- The end of software as we know it today is not a matter of whether it will happen, but when. The only debate left is the new costing models, i.e., monthly rate per user.
The seven core competencies of Web 2.0 applications allows for new design architectures and deployment

- Services, not packaged software, with cost-effective scalability
- Control over unique, hard-to-recreate data sources that get richer as more users update it
- Trusting users as co-developers
- Harnessing collective intelligence
- Leveraging the long tail through customer self-service
- Software above the level of a single device
- Lightweight user interfaces, development models, AND business models
IT Challenges for the Enterprise CIO

- Inability to respond to changing business needs
  - Complexity due to heterogeneity
  - Inflexibility of packaged business applications
  - Fragility of the current systems

- Lack of available skills to maintain current systems
  - Requires large multi skilled resources to develop, deploy & Manage

- Inefficient resource utilization of existing application
  - Difficult to upgrade, interoperate and integrate
  - Impractical to replace
Cisco and the Data Center – Virtualization of the Hardware as disruptor
Is the Data Center An Enabler Or An Inhibitor To Your Business?

- Hyper-growth of Storage at 40-70% per year
- Utilization ~15-25% (Servers/Storage)
- Power & Cooling ~25-30% of total DC costs
- Operations taking another ~30% of total DC costs
- Information Retention extending from 3 to 10 years
- New Applications can take 60-180 days to deploy

"By 2009 50% of today’s data centers will have insufficient power and cooling capacity to meet the demands of high-density equipment”

Source: Gartner, 2008
Virtualization Will Be the Most Disruptive Technology in IT Operations Through 2010

Virtualization is the abstraction of IT resources in a way that masks the physical nature and boundaries of those resources from resource users.

Virtualization will change:

- How you plan
- How, what and when you buy
- Who you buy it from
- How and how quickly you deploy
- How you manage
- How you charge
- Technology, process, culture

It will transform your approach to client computing
Cisco’s Technology Vision: The Intelligent Information Network (IIN)

Network Intelligence

INTEGRATED TRANSPORT

INTEGRATED SERVICES

INTEGRATED APPLICATIONS

The Intelligent Movement of Data / Voice / Video across a System of Networks

Network-Enabled Applications

Virtualized Resources and Services

PHASE 1

PHASE 2

PHASE 3

Get more value from applications and services

Get more value from infrastructure and resources

Get more value from the network foundation
The New World Order… Moving from traditional on-premise software and hardware models to “Software as a Service”

Current: ‘Accidental Architecture’
- Silo’d IT resources
- Low utilization, power inefficiency
- Branch offices → ‘mini data centers’

Emerging: Web 2.0 Model
- Cloud of virtualized services
- Significant new resource demands
- Challenges with visibility, control, security
Incremental Approach to Data Center 3.0

**Consolidate**
- Reduced complexity, less to manage
- Lower OPEX
- Regain control of IT resources

**Virtualize**
- Higher resource utilization
- Lower CAPEX
- Decouples logical from physical resources

**Automate**
- Dynamically allocate resources
- Simplified policy-based provisioning
- Increase IT productivity

The Network is the Platform
Evolution of the Data Center

**VIRTUALIZATION**
Management of resources independent of underlying physical infrastructure to increase utilization, efficiency and flexibility

**CONSOLIDATION**
Centralization and standardization to lower costs, improve efficiency and uptime

**AUTOMATION**
Dynamic provisioning and autonomic Information Lifecycle Management (ILM) to enable business agility

Business Policies
On-Demand
Service Oriented

Compute
Network
Storage
# Power of Reusability of Network Services

Leveraging Network Based Services Decreases Application Deployment Time and Increases Performance

<table>
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**DATA**

**LOGIC**

**UI**
Interactive Services Layer
Cisco Differentiation

**Application Delivery**
- Application Velocity System
- Wide Area Application Services
- Content Services Switch/Content Services Module

**Application-Oriented Networking**
- Intelligent message routing (translation, transformation, reliable delivery), SOA support
- Application-to-application security
- Application message/business event visibility and responsiveness

**APPLICATION NETWORKING SERVICES**

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**APPLICATION SERVICES**

- VOICE SERVICES
  - IPT
  - E911
  - Presence Services

- SECURITY SERVICES
  - App security
  - VPN/SSL
  - Virtual firewalls
  - Anti-X
  - DDoS
  - NAC
  - HTTP inspection

- MOBILITY SERVICES
  - Access Technologies
  - Distribution Technologies
  - Applications
  - IP Mobility

- STORAGE SERVICES
  - VSAN
  - Data replication
  - Remote backup
  - Tape acceleration
  - File Virtualization

- COMPUTE SERVICES
  - RDMA
  - Server virtualization
  - I/O virtualization
  - File/Print

- IDENTITY SERVICES
  - 802.1X
  - RADIUS
  - ACLs

Interactive Services Layer
Cisco Differentiation

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Integrated Network Services Architecture

Application Layer

- Application Network Interface Access
  - API Integration
  - Developer Toolkit
  - Scripting Automation
  - Off Net

Application Services

- ESB Services
- Context Based Routing
- Load Balancing
- Application Acceleration
- Caching

Integrated Network Services

- Security
  - Operational Control
  - Secure Transactions
  - Threat Mitigation
  - Confidential Communications
- Communications
  - Speech
  - Policy
  - Presence
  - Mobility
- Mobility
  - Location
  - Voice
  - Security
  - Guest Access
- Storage
  - Backup/Recovery
  - Migration
  - Replication
  - Virtualization
  - Compliance/Retention
- Identity
  - RADIUS
  - Accounting
  - 802.1x
  - NAC
- Compute
  - Virtualization

Network Systems

- Routing
- Availability
- Statistics
- Virtualization
- VPLS
- L2/L3 VPN
- DPI
- Encryption
- Switching
- Connection Management
- CoS QoS
- IPv4 IPv6
- MPLS
- Multicast

Physical Implementation

- Data Center
- Campus
- WAN
- Branch
Integrated Network Services – Guest user access example

Exposed
Authenticate user and/or client device

Transparent
Logs user information and protects network

Transparent
Secure VPN for Internet only access

Exposed
Location services track device

Exposed Access Requested

Architectural Concept and Functional Roles

Application Layer
Applications Functions
Authentication Collaboration
AP's Integration
Developers Toolkits
Convergence

Application Services
Context Based Routing
Load Balancing
Acceleration
Caching

Exposed
Security
Operational Control
Secure Transactions
Threat Mitigation
Confidential Communications

Unified Communications
Speech
Policy
Identity
Presence
Media
Mobility
Guest Access

Mobility
Location
Voice
Security

Storage
Backup/Recovery
Migration
Replication
Virtualization
Compliance/Retention

Identity
RADIUS
Accounting
802.1x
NAC

Virtualization
VPLS
L2/L3 VPN

MPLS
Multicast
DPI
Encryption

IPv4
IPv6

CoS
IPv4

Network Systems
Routing
Availability
Statistics Counters
Virtualization

Switching
Connection Management
CoS
IPv4

Data Center
Campus
WAN
Branch

Exposed

Transparent

Physical Implementation

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Mash-up Applications Utilizing Worldwide Data Centers

Delivering “high touch” applications regardless of data location
SODC: Creating Virtual Services from Physical Infrastructure PODs

Data Center Automation
- Specific resources selected from pools
- VLANs, VSANs are configured
- Macros are played
- SAN is zoned
- Servers get booted with assigned image
- Application(s) are started
- Traffic into logical network turned “on”
The Network Facilitates IT- Business Alignment

Cisco Data Center 3.0

- Repurpose the network as a virtualized data center fabric
- Abstract logical services from physical resources
- Dynamically provision services to meet business demands
- Enhance collaboration between IT and the business
Data Center Strategic Initiatives

Extend the Value of the Current Operational Model

- Lower Operating Costs
- Infrastructure Resilience
- Power and Cooling
- Application Delivery
- Holistic Security
- Compliance

Enabled by: Consolidation, Virtualization

Improve IT Effectiveness in the New Environment

- Event- and Policy-Driven Real-Time Infrastructure
- Unification of Components, Networks, Communications
- Streamlined Business Processes, IT as a Service

Enabled by: Automation
Partner Programs

Key Components of Architecture Solutions

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Cisco Technology Developer Program

Uniting Cisco with 3rd Party Application vendors of complementary network-enabling technologies to deliver interoperable Solutions

~ 371 partners
~ 49 Affiliates
Ease Deployment, Reduce Risk, Improve Resilience with Data Center Networking Design Best Practices

www.cisco.com/go/datacenter
Value Proposition of an Architectural approach to enable Web 2.0 in the Enterprise

- Deliver an architectural approach to connecting network services to applications to deliver business solutions
- Leverage proven Cisco system and solution delivery processes to reduce risk and differentiate enterprise offering
- Enable advanced services and/or consulting practices targeting vertical markets
- Localize systems and solutions with proven partners and channels
- Enables enterprises to optimize network aware applications and services globally across their businesses